

REMARKS

This Application has been carefully reviewed in light of the Office Action mailed June 24, 2010. At the time of the Office Action, Claims 11–22 were pending, and Claims 1–10 were previously cancelled. All pending Claims 11–22 were rejected in the Office Action. Independent Claims 11, 17, and 21 are herein amended. Applicants respectfully request reconsideration and allowance of all pending claims in view of the amendments set forth above and the remarks set forth below.

Amended Independent Claims 11, 17, and 21 are Allowable.

Independent Claims 11, 17, and 21 were rejected under 35 U.S.C. §102(b) as being anticipated by *Makki* (U.S. Patent Application Publication No. 2004/0006973).

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, “the identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co. Ltd.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Although Applicants do not necessarily agree with these rejections, Applicants have amended independent Claims 11, 17, and 21 to advance prosecution in a timely manner. For example, amended Claim 11 recites, in part:

determining if the generated post-cat oxygen sensor measurement signal is representative of the characteristic post-cat oxygen sensor measurement signal based on the comparison;

if the generated post-cat oxygen sensor measurement signal is determined to be representative of the characteristic post-cat oxygen sensor measurement signal:

calculating a gradient of the post-cat oxygen sensor measurement signal based on at least two values of the post-cat oxygen sensor measurement signal; and

determining an individual mass of fuel metered-in to the cylinder as a function of the calculated gradient of the at least two values of the post-cat oxygen sensor measurement signal

Amended independent Claims 17 and 21 recite similar limitations. Applicants' specification explains the advantage provided by the amended limitations:

[0013] The mass of fuel to be metered-in on a one-time basis is determined as a function of a gradient of the measurement signal of the post-cat oxygen sensor. The gradient is a very good indicator of the state of the three-way catalytic converter and therefore as to whether a slight or severe oxygen overflow is present. In this way, the stored oxygen remaining in the three-way catalytic converter after metering-in of the mass of fuel to be metered-in on a one-time basis can be very precisely adjusted.

Applicants' specification later explains an example implementation of this feature:

[0051] If the condition of step S6 is fulfilled, in a step S7 a gradient GRAD_MS of the measurement signal MS of the post-cat oxygen sensor 37 is determined as a function of the temporarily stored values of the measurement signal MS. In this context the gradient GRAD_MS is taken to mean the variation over time, i.e. the time derivative of the measurement signal MS. The gradient GRAD_MS can be determined in different ways, for example the gradient may denote the fall over time of the measurement signal MS immediately after the first threshold value THD1 has been undershot and therefore be characteristic of the rate at which the measurement signal MS is decreasing. However, it can also be determined as being characteristic of the rate of increase of the value of the measurement signal up to the first threshold value THD1.

...

[0054] In a subsequent step S11, the mass of fuel to be metered-in on a one-time basis MFF_ADD is determined as a function of the gradient GRAD_MS of the measurement signal MS of the post-cat oxygen sensor 37 and/or the minimum value MIN_MS of the measurement signal MS of the post-cat oxygen sensor 37 and/or the estimated value OSC of the current oxygen storage capacity of the three-way catalytic converter 22. Preferably this takes place optionally by means of one or more engine maps determined in advance by experiments or even simulations.

Makki does not teach these limitations. The Examiner alleges that *Makki*, paragraph 0040 teaches "determining an individual mass of fuel metered-in to the cylinder: as a function of a gradient of the post-cat oxygen sensor measurement signal," which was previously recited in Claim 11 prior to the current amendment. (Office Action, page 3). However, paragraph 0040 of *Makki* does not teach anything about a gradient of a post-cat oxygen sensor measurement signal. Paragraph 0040 teaches:

[0040] At T=224.5 seconds, the output signal (HEGO_S) falls below 0.2 volts indicating the catalyst 52 is saturated lean. As a result, controller 58 sets the value (CAT_STATE) equal to "1" indicating the catalyst 52 is saturated lean. Further, controller 58 disables the (INTEGRATION_ENABLE) flag so that the value of (CAT_STATE) will be maintained at the value "1". Further, controller 58 ramps the air-fuel control signal (LAMBSE) aggressively toward a richer air-fuel ratio in order to return the system 14 back to the desired state (i.e., CAT_STATE=0).

Makki does not teach anything about a **gradient** of the output signal HEGO_S, or any other signal for that matter. Moreover, *Makki* does not teach **calculating a gradient of the HEGO_S signal based on at least two values of the HEGO_S signal** (or any other signal), much less **determining an individual mass of fuel metered-in to a cylinder as a function of the calculated gradient of the at least two values of the HEGO_S signal**. Thus, *Makki* cannot provide the advantages associated with this feature discussed in Applicants' specification (e.g., as mentioned in paragraph 0013 copied above).

Thus, for at least the reasons set forth above, amended independent Claims 11, 17, and 21 are allowable over *Makki*. Accordingly, Applicants respectfully request allowance of amended independent Claims 11, 17, and 21, as well as all claims that depend therefrom.

All Dependent Claims are Allowable.

Dependent Claims 12, 14-16, 18, 20, and 22 were rejected under 35 U.S.C. §102(b) as being anticipated by *Makki*.

Dependent Claims 13 and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over *Makki* as applied to claims 11 and 17 above in view of *Schnaibel* (U.S. Patent No. 5,901,552).

Applicants submit that all dependent claims are allowable at least because they depend from the independent claims shown above to be allowable. Further, *Schnaibel* fails to teach the features of the independent claims not taught by *Makki*. Further, Applicants do not concede that the proposed combination of *Makki* with *Schnaibel* is legally proper. Thus, for at least these reasons, Applicants respectfully request reconsideration and allowance of all pending dependent claims.

PTO Form 892

Applicants would like to bring to the Examiner's attention that certain claims have been rejected under 35 U.S.C. § 102(b) and 103(a) as being unpatentable in view of U.S. Patent Application Publication No. 2004/0006973 filed by Makki et al. and U.S. Patent No. 5,901,552 issued to Schnaibel et al. These references have not been identified on a PTO-Form 892, nor were they references submitted by Applicants on a PTO-Form 1449. Applicants respectfully request that Makki and Schnaibel be listed on a PTO-Form 892 in the next action.

CONCLUSION

Applicants have made an earnest effort to place this case in condition for allowance in light of the remarks set forth above. Applicants respectfully request reconsideration of the pending claims.

Applicants believe there are no fees due at this time. However, the Commissioner is hereby authorized to charge any fees necessary or credit any overpayment to Deposit Account No. 50-4871 of King & Spalding L.L.P.

If there are any matters concerning this Application that may be cleared up in a telephone conversation, please contact Applicants' attorney at 512-457-2030.

Respectfully submitted,
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Date: 9/17/10

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